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no.14
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TREASURY DEPARTMENT.
Public Health and Marine-Hospital Service of the United States.

Public Health JLLETIN NO. 14

EXTRACT FROM ANNUAL REPORT, 1904.

SANATORIUM FOR CONSUMPTIVES,

FORT STANTON, NEW MEXICO.

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SANATORIUM FOR CONSUMPTIVE SEAMEN, FORT STANTON, N. MEX.

Report of Surg. P. M. Carrington, in command.

UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
OFFICE OF MEDICAL OFFICER IN COMMAND,
Fort Stanton, N. Mex., August 2, 1904.

SIR: I have the honor to report as follows regarding the transactions of this station for the fiscal year ended June 30, 1904:

Statistics.

Patients under treatment July 1, 1903		150
Patients admitted during the year		236
Patients under treatment June 30, 1904		192
Patients discharged during the year		194
Ages of patients treated during the year:		
Under 25 years	56	
Between 25 and 34 years	134	
Between 35 and 44 years	117	
Between 45 and 54 years	61	
Over 54 years	18	
		386
Heredity in patients admitted during the year:		
History of tuberculosis in parents		105
No history of tuberculosis in parents		281
Stage of disease (first stage meaning where no consolidation nor excavation can be discovered; second stage meaning considerable involvement and consolidation without excavation; third stage with excavation):		
First stage		34
Second and third stages		200
Nontubercular		2
Area of involvement as shown by physical examinations:		
Right lung only	20	
Left lung only	15	
Both lungs	346	
Doubtful diagnosis of tuberculosis	5	
		386
General condition at arrival "good," meaning well nourished and without grave complications; "bad," meaning rather poorly nourished or with complications not necessarily fatal; "very bad" meaning much emaciated or with grave complications such as organic heart disease, chronic nephritis, or advanced laryngeal involvement):		
Good	83	
Bad	159	
Very bad	144	
		386
Tubercle bacilli:		
Were not present in the sputum of		26
Were present in the sputum of		360
Record of patients who had pulmonary hemorrhages:		
Before arrival only		107
After arrival only		15
Both before and after arrival		28

The greatest number of patients under treatment at one time during the year was 208.

Condition of 194 patients at time of discharge:		
Apparently cured	15	
Arrested	9	
Improved	87	
Unimproved	19	
Died	62	
Two patients, non-tubercular, admitted and discharged cured	2	
		194

Duration of stay and character of cases.

Character of case.	Longest stay.			Shortest stay.			Average stay.		
	Years.	Months.	Days.	Years.	Months.	Days.	Years.	Months.	Days.
Cured	2	7	4		5	18	1		17
Arrested	1	5	15		2	18		11	12
Improved	3		21			9		7	12
Unimproved	3	7	14			2		8	11
Died	2	9	16			4		5	10

I have divided the patients into two classes: List A, which consists of patients who were under treatment at the beginning of the fiscal year; and List B, which consists of patients who were admitted during the year.

LIST A.—*Patients under treatment at beginning of fiscal year.*

	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged	14	5	41	9	23	92
First stage	8		2	1	[a]1	12
Second and third stages	5	6	39	8	22	80

Patients under treatment July 1, 1903	150
Remaining under treatment June 30, 1904	58
Discharged during the year	92

LIST B.—*Patients admitted during year.*

	Nontubercular (cured).	Cured.	Arrested.	Improved.	Unimproved.	Died.	Total.
Cases discharged	2	1	4	46	10	39	102
First stage		1	4	8	2	1	16
Second and third stages			1	37	8	38	84

Admitted during the year	236
Discharged during the year	102
Remaining at end of year	134

Complications.

Syphilis	50	Fistula in ano	2
Cardiac valvular disease	39	Renal calculi	1
Functional disease of heart	17	Keratitis	1
Nephritis	7	Cataract	1
Rheumatism	1	Nasal polypi	4
Anæmia	1	Occlusion of nares	2
Diabetes	2	Occlusion of lachrymal duct	2
Hydropericardium	1	Lateral spinal curvature	1
Hydrocele	2	Lumbago	1
Appendicitis	1	Hemorrhoids	36
Rupture of tympanic membrane	1	Varicocele	13
Hæmatoma testicle	1	Adenitis	16
Deafness	4	Hernia	13
Pleurisy with effusion	8	Varicose veins of leg	5
Fracture of ribs	1	Hepatitis and ascites	1
Hydropneumothorax	1	Acute mania	2
Gastritis	3	Incontinence of urine	1
Necrosis of lower jaw	2	Epilepsy	1
Chronic diarrhea	3	Otitis media	2
Polyuria	9	Effusion of knee joint	2

[a] Nephritis.

Complications—Continued.

Aneurism	1	Eczema	1
Peritonitis	1	Necrosis of rib	1
Ununited fracture inferior maxilla	1	Biliary calculi	1
Pyopneumothorax	2	Iritis	1
Pneumothorax	2	Atony of bladder	1
Cystitis	1	Stricture	4
Epididymitis	1	Perirectal abscess	2
Asthma	4	Partial paralysis	1

Organs other than lungs affected.

Larynx	47	Intestines	25
Testicles	1	Hip joint	2
Knee joint	1	Vertebræ	1
Ribs	1	Tarsal bones	1
Trachea	1	Pharynx	2
Œsophagus	1	Peritoneum	2
Meninges brain	1	Ischiorectal abscess	1
Fistula in ano	2	Lymph glands	2

Length of time under treatment at sanatorium.

Over two years	9
Between one and two years	27
Between six and twelve months	45
Between three and six months	47
Under three months	66
Total	194

Of the 194 patients discharged during the year 24 were under treatment for less than thirty days. The results in these cases were as follows:

Improved	4
Unimproved	5
Died	15
Total	24

During the year we have had under treatment, in addition to the above, consumptive officers and employees as follows:

Under treatment July 1, 1903	10
Admitted during the year	11
Total	21
Still under treatment June 30, 1904	11
Left during the year	10

Condition of those leaving at time of discharge:

Apparently cured	2
Improved	7
Unimproved	1

Our results are very conservatively stated, and under any usual nomenclature would show a much larger proportion of cured cases. Several months ago, noting the large number of patients discharged without physical or other signs of disease, or only with signs indicating healed lesions, but who had been under treatment only from three to six months, and were for this reason recorded as "improved" cases, I adopted the plan of calling such cases "arrested," and the "improved" cases herein recorded include a great many which might properly be recorded as "arrested" cases.

It is to be hoped that the efforts which are being made to devise a uniform system of nomenclature for tuberculosis will be successful, and that the various terms employed will thereafter always mean the same thing wherever and by whomsoever used. I wish to renew the recommendation contained in my report of 1903, that some law be secured or regulation adopted which will give greater control over patients and enable us to retain them under treatment for a sufficient period to insure recovery or demonstrate their incurability.

During the fiscal year under consideration the rainfall has been greatly less than during any year in the life of the sanatorium, and notwithstanding the comparatively small number of cured cases reported this year, our patients have undoubtedly done better, as a rule, than heretofore. While we have a considerable percentage of deaths, this is not remarkable when the character of cases admitted is taken into consideration.

TREATMENT.

The treatment has been, in the main, as heretofore, hygienic, dietary, and symptomatic. I have experimented with the bacillary treatment introduced by Doctor Maher, of Connecticut, and, while his treatment has undoubtedly been of benefit in a certain proportion of cases, the observations have not been sufficiently prolonged to warrant an opinion at this time of its value.

The daily breathing exercises have been continued and have proven of undoubted value, and the drill has also promoted good discipline.

Nose and throat clinic.—The nose and throat clinic, which was for a time necessarily suspended, owing to shortage in medical officers, was resumed November 16, since which date the following cases have been treated:

Disease.	Cases.	Disease.	Cases.
Rhinitis:		Laryngitis:	
Acute	5	Acute	6
Chronic	2	Chronic	4
Hypertrophic, rhinitis	5	Tuberculosis of larynx	17
Rhinitis chronic and pharyngitis chronic	16	Tuberculosis of larynx and pharyngitis sicca	1
Empyema of the frontal sinus	1	Syphilis:	
Perforation of septum nasi (tuberculous)	1	Secondary of pharynx	2
Epistaxis	2	Ulceration of septum, nasi	1
Pharyngitis:		Otitis:	
Simple acute	20	Media suppurative, acute	2
Simple chronic	12	Media suppurative, chronic	12
Subacute	2	Media suppurative, chronic and eczema of both auricles (moist)	1
Atrophic or sicca	5	Media, catarrhal	2
Follicular or granular	3	Perichonditis, auriculæ	2
Tonsilitis, follicular	4	Cerumen, impacted	5
Uvulitis	1		
Stomatitis	2		

Operations.

Disease.	Cases.	Disease.	Cases.
Removal of spur from septum, nasi	5	Removal nasal polypi (14)	1
Removal posterior end of middle turbinate	1	Removal nasal polypi (8)	1
Removal anterior end of middle turbinate	5	Paracentesis auriculæ	2
		Hajiek's operation for deflected septum	1

Several cases of laryngitis included in the report of nose and throat work were treated by applications of bacillus X of Maher with marked benefit.

REPAIRS TO BUILDINGS, ETC.

This being in the natural course of events the last annual report of the operations of this sanatorium which I shall render, it seems appropriate to give a brief résumé of the work under this head which has been accomplished during my detail. When I assumed command of the station in January, 1901, very little in the way of repairs had been accomplished except interior repairs to building No. 1, commanding officer's quarters, minor repairs to building No. 2, passed assistant surgeon's quarters, and certain essential repairs to the hospital building.

During the past three and a half years nearly all the buildings have been reshingled, and No. 4 has been overhauled and repaired for occupancy by convalescent patients. Building No. 5 has been converted into a power plant and steam laundry. In this building we have placed an ice plant, with cold storage rooms and dairy facilities and an additional boiler which furnishes steam heat for buildings Nos. 4, 5, and 7. In this building also has been placed a dynamo, which supplies light to all buildings and the corrals and a considerable portion of the grounds.

Building No. 6 has been converted into a modern kitchen and dining room, with subsistence storeroom, bakery, and attendant's quarters.

Building No. 7, which in January, 1901, consisted of bare stone walls left after the building was destroyed by fire during the army occupancy, has been rebuilt, and is now occupied as an executive building and laboratory.

Building No. 9 has been remodeled and the first floor contains the post-office, two storerooms, and a commodious tobacco and barber shop, while the upper floor has been converted into a light and airy hall, which is used for reading room and chapel, with book and other necessary rooms adjoining.

Buildings Nos. 10 and 11, which were in utter dilapidation, have been converted into well-lighted and ventilated dormitories, and are now occupied by ambulant consumptives, No. 11 containing also a modern and well equipped operating room with dressing room and surgical ward.

No. 13 has been entirely done over, and is so arranged that it may be used for either single men or families. It is now occupied by two assistant surgeons, several patients who are commissioned officers of other services and beneficiaries of this Service, and employees detailed in the office. These, except one commissioned officer who has a family, constitute the "bachelor officers' mess."

All these buildings have been supplied with modern plumbing, and on buildings Nos. 1, 2, 3, and the hospital commodious and artistic porches have been erected.

The corrals have been completely done over; a sufficient number of stalls and feed rooms were erected in the horse corral; hay sheds and milking sheds with cement floors have been erected in the cow corral. The corrals are also lighted by electricity and dangerous oil lanterns dispensed with.

An electric motor has been installed and is used for pumping water. In connection with the electric light plant over 1,000 lights and an electric fire alarm system have been installed.

The expenses of repairs to buildings since I assumed command of the station, including contracts, material, labor, and salary of architect, have been $134,525.86.

WATER SUPPLY.

During the year just ended the question of water supply has been most perplexing, and the scarcity of water has been a source of constant anxiety. The failure of the rains during the summer of 1903, and the almost total absence of snow in the mountains during the past winter, deprived us of our former supply of water from the Rio Bonito. The old army wells became almost dry and practically our only source of supply has been some little springs which rise in the bed of the Rio Bonito about 1 mile west of the buildings. The water from these springs has been carried through a ditch to the old sutler's store, used in the early days of the sanatorium as a chicken yard, and thence by means of a flume across the river to a wooden tank at the army well; thence it has been pumped to small reservoir on little round-top hill. With great economy this has been sufficient to supply our urgent domestic needs, but we have been unable to store any water, and night after night we have gone to bed with less than 5,000 gallons of water in the reservoir, a condition, which especially during the windy season, has given rise to the gravest apprehensions, for, had a fire occurred at this time, we would have been absolutely helpless. On more than one occasion it has been a question of going without coffee or dispensing with the morning ablutions. The uncertainty of the water supply and its inadequacy led to a recommendation for boring a new well. This recommendation was approved by the Bureau; the well has been bored, cased, and the pump is now being placed. A partial test showed that this well should furnish not less than 40,000 gallons of water daily, running the pump both night and day. Additional wells for irrigating the garden and alfalfa fields should be bored, and it is probable that in boring such wells, water will be developed sufficiently near the surface to permit pumping by means of windmills. Earth reservoirs may be constructed at small cost and water stored for irrigating purposes. Such reservoirs can also be used as fish ponds, and thus add to our dietary an important article of food, which we are at present unable to use by reason of our distance from sources of supply.

MILK SUPPLY.

The shortage of milk referred to in my report of 1903 is less than heretofore. During the fiscal year 1903 we produced 19,120 gallons of milk. During the fiscal year ended June 30, 1904, we produced and used 24,053 gallons of milk and a small quantity of butter. The increase in the milk supply has been accomplished by reason of the addition to our herd, by natural increase, of a number of cows and in the natural order of events the number of milk cows will continue to increase, and it is only a matter for a short time when, without any additional purchases, we will be able to produce all the milk we can consume.

A purchase of milk goats has been authorized by the Bureau in order to add to the milk supply and give occupation to the patients willing to undertake their care. There has been some difficulty in securing goats of the right kind, but negotiations are now under way and within a few weeks the experiment will be begun.

RANGE OF BEEF CATTLE.

Our beef herd continues our most promising investment. The number reported on hand on my report of 1903 was 369. The property return for the same period showed 401. This difference is accounted for by the transfer on the property return of a number of Jersey steers from the dairy to the range herd and by probable error in count of a few head.

The present record of our cattle is as follows: We have branded this season 149 calves: 46 head of cattle have been killed for beef, and 10 head have died. We have remaining 474 head. There are also 110 head of cattle in the dairy herd. A portion of these 110 have heretofore been reported as having been transferred to the beef herd. By a recent authority granted by the Bureau all cattle are now entered on the property return as "Cattle." This total of 584, therefore, includes all range stock and dairy stock, consisting of bulls, cows, 2-year olds, yearlings, and calves.

The 46 head of cattle killed dressed 17,563 pounds, worth at contract price $1,229.31.

The original investment of beef cattle, including the bulls recently purchased, was approximately $6,800, and although the herd has not grown sufficiently large to entirely supply us with beef, yet in the past two years we have killed and used beef equal in value to almost one-third of the original investment.

The progress of our cattle investment may be better shown by the following statement:

Original investment	$6,800.00
Value of beef consumed	2,192.48
Net investment	4,607.52
Present value of the herd:	
9 bulls (3 station raised), at $75	675.00
3 bulls, thoroughbred	1,000.00
462 head of cows and young stuff at an average valuation of $25	11,550.00
Total	13,225.00
Net investment	4,607.52
Showing an actual profit in three years of	8,617.48

From this sum should be subtracted salary of one cowboy for three years and salt fed to range cattle, but even after subtracting these items, amounting to approximately $1,200, there remains a net profit of over $7,400, which is a most excellent showing, and our herd of cattle is generally conceded by cattlemen in this vicinity to be as fine as any in the Territory, if not the very finest.

HORSES.

Our experiment in horse raising, begun three years ago, has been most successful. We now have 18 colts, 7 of which will be 3 years old in the spring of 1905.

HOGS, POULTRY, ETC.

We have no difficulty in raising all the hogs we can feed. During the present year we have killed a number of hogs which have dressed 11,602 pounds and furnished 1,140 pounds of lard. These products at the contract prices were worth $756.80.

Belgian hares, while considered a delicacy by a great many people, were not popular with our patients, and, as the expense of raising them was considerable, I killed and served those on hand, amounting to 325 pounds.

Our poultry yard has furnished 425 pounds of dressed chickens, 75 pounds of dressed turkey, and 610 dozen eggs. Our flock of chickens now number 555; 365 of which have been raised in the past three months.

The flock of pigeons numbers over 100, and we have a constant supply of squabs for use at the hospital.

FARM AND GARDEN.

The farm and garden work, owing to the extreme scarcity of water, has been most disappointing, but the young orchard of fruit trees has not only been kept alive, but is growing and a portion of the orchard should bear fruit next year.

LIBRARY.

The new library and reading room, recently occupied, is a very valuable means of entertainment for the patients. The books have been neatly numbered, classified, arranged, and catalogued, and a system of cards provided, so that the patients may receive books and at the same time the librarian may keep a proper account of them.

SANATORIUM ADMINISTRATION.

The growth of the sanatorium has rended it necessary to systematize the work, assigning to each officer his portion, which I have done in the following order:

Assignment of medical officers and schedule of daily duties.

The commanding officer will assume charge of the entire sick call, assisted by Acting Assistant Surgeon O'Reilly.

Assistant Surgeon Trask is detailed in charge of the laboratory, including the routine and special work. He will also have supervision over necropsies and all other pathological work.

Assistant Surgeon Ebert is detailed in charge of the physical examination room, and will have charge of all clinical records of every description.

Acting Assistant Surgeon Laws is detailed to assist Assistant Surgeon Ebert in the physical examination room during the forenoon, and in the afternoon as assistant in the pathological work of the laboratory.

Acting Assistant Surgeon O'Reilly will act as assistant to the commanding officer at morning sick call, and will review the medical journals, marking articles of interest for the commanding officer.

Acting Assistant Surgeon Walker is detailed in charge of the nose and throat clinic, and will receive and treat such cases as may be referred to him by any of the officers making sick call; he is also detailed as attending surgeon to the attendants and other employees, and will have charge of the surgical clinic.

Acting Assistant Surgeons Laws, O'Reilly, and Walker will alternate month about in making evening sick call, the object of the evening sick call being to meet such emergencies as may arise after morning sick call is made and which could not, without prejudice to the patient, remain unattended until the following morning.

OFFICER OF THE DAY.

The junior medical officers will serve successively as officers of the day, and will be on duty as such for twenty-four hours, beginning at 6 o'clock a. m. It will be the duty of the officer of the day to make inspection of all wards, tents, and rooms occupied by patients between 8 and 9 o'clock a. m., and at 10.30 a. m. he will report the result of such inspection verbally to the commanding officer. It will also be the duty of the officer of the day to see arriving patients, assign them to beds, and see that they are otherwise properly cared for, and to answer emergency calls.

The officer of the day will also make a general round of inspection, between the hours of 9 a. m. and midnight, with the object of ascertaining whether or not good order is prevailing; this round will extend from the vicinity of the hospital to the corrals, and the officer of the day will exercise his judgement about entering buildings. The tent village should always be included in this inspection. In case of necessity, the commanding officer may be called at any hour to receive report concerning any matter which, in the opinion of the inspecting officer, may require immediate attention, and a verbal report may be made the following morning of matters not especially urgent, but still requiring attention.

The officer of the day will not be excused from duty, and will not absent himself from the occupied portion of the reservation during his twenty-four hours of duty; he should remain in easy call, and when not in the executive building should indicate on the office bulletin board where he may be found.

OFFICE HOURS.

Medical officers, pharmacists, and office assistants will report at the office of the commanding officer at 8.30 a. m and 1.30 p. m. This order, however, shall not pre-

vent the officer of the day completing his inspection in the proper manner, even though to do so may prevent him reporting before 9 a. m.

All affected by this order will be expected to remain at their posts of duty, unless excused, from 8.30 a. m. until noon, and from 1.30 p. m. until the day's business is completed.

Office hours on Sunday from 8.30 a. m. until noon only.

OFFICIAL DAILY SCHEDULE.

Surgeon Carrington.—8.30 a. m., office; 8.40 a. m., hospital sick call; 9.30 a. m., ambulant sick call. From 10.30 until noon the commanding officer may be found in his office to receive necessary reports and attend to the requests of patients and others; he will also be in his office from 1.30 p. m. to the close of business.

Assistant Surgeon Trask.—8.30 a. m., at office, and then to laboratory room until 12 o'clock noon, and from 1.30 p. m. until the close of business also in the laboratory.

Assistant Surgeon Ebert.—8.30 a. m., office, then to examination room until noon. From 1.30 p. m. until the close of business in examination room working on records.

Acting Assistant Surgeon Laws.—8.30 a. m., office, then to examination room until noon. At 1.30 p. m. in the laboratory until excused by Assistant Surgeon Trask.

Acting Assistant Surgeon O'Reilly.—8.30 a. m., office, then to accompany the commanding officer on sick call. At 1.30 p. m., at office, for going over medical journals and such other work as may be verbally assigned to him.

Acting Assistant Surgeon Walker.—8.30 a. m., office until 9 a. m., seeing employees who may have been reported sick by the pharmacists. From 9 to 12 o'clock at the nose and throat clinic. From 1.30 p. m. until completion of the work at the surgical operating room.

Pharmacists.—Must also report at the office at 8.30 a. m. and afterwards will proceed to their usual duties.

NECROPSIES.

As a rule necropsies will be held at 1.30 p. m., immediately after officers have made their afternoon report, and on necropsy days all other work after noon will be omitted, except in cases of emergency.

All officers will be expected to be present at necropsies, but the officer in charge of the surgical clinic will complete his surgical dressings before reporting at the necropsy room.

NOTES.

The officer in charge of the surgical clinic will send to the laboratory specimens from cases under his care and of which it is desired to have an examination made. He will consult the officer in charge of the laboratory as to the character of such specimens.

Inspection and muster will be held on Saturdays at 7 a. m.

The officer of the day may call, or cause to be called, any other officer in case assistance is needed, and any officer so called shall respond promptly.

Nothing in this order shall be construed as authorizing discontinuance of work prior to 4 p. m.

This order, essentially, is still in force, although some of the officers mentioned therein are no longer on duty here, and it has proven very satisfactory in operation.

In order to keep a check on the patients the head nurse and the night watchman each have a roll book, showing the building and bed occupied by each patient. Roll is called at morning sick call, after which absentees are looked up and accounted for, and the night watchman again makes roll call by bedside visitation at 9 p. m. The double daily inspection by the officer of the day has had a most beneficial effect.

Our records have been greatly improved during the past three years, and we keep a number which are not required by the Regulations, but which greatly facilitate our work and its tabulation. I inclose a specimen of the clinical chart at present in use. A careful record is kept of all work done in the laboratory, nose and throat clinic and examination rooms, and the officers in charge of these divisions of work make daily, monthly, and other periodical reports to me of their work.

LABORATORY.

During the last ten months of the fiscal year the following work was done in the laboratory:

Sputum examinations	1,112
Urine examinations	540
Quantitative examinations for sugar in urine	5

Hemoglobin estimations according to Fleischel	124
White blood cell counts	13
Red blood cell counts	2
Examinations of blood for the plasmodium malariæ	2
Quantitative and qualitative gastric juice analysis	1
Feces examinations	8
Microscopic examinations of exudates, transudates, and pus	9
Necropsies	52

Not all the necropsies have been written up to date, for the reason that we have been unable with the force at our disposal to work continuously at them.

Besides the foregoing routine laboratory work, considerable other work has been carried on, as follows: Experiments to establish the condition of our hospital and dormitories with reference to their possible infection with tubercle bacilli; the administration of the tuberculin test to our dairy herd of 60 milk cows; work done to ascertain morphological, cultural, and pathological character of the bacillus X of Maher; also the examination of milk from our different dairy cows to establish the absolute and relative value of their yield.

A full and detailed report of the work done in the laboratory, prepared by the officer in charge, is submitted as an exhibit with this report.

DURABILITY OF CURE.

Being myself a beneficiary of this sanatorium, its conduct, operations, and aims have become very dear to me, and when I begin to talk or write of it it is very difficult for me to limit my remarks to proper proportions.

There is one question of paramount importance to the individual consumptive—namely, the durability of cure. We are unfortunately not able to secure the subsequent histories of a good many of our patients. I do, however, receive an occasional letter from patients, who have been away from the sanatorium for a few months, and I recently received one from a patient discharged over three years ago, which is of so much interest as bearing on this question of the durability of the cure, as to warrant, I think, an extract from it being included in this report.

[Copy of letter from Capt. John S. Simmons, discharged March 31, 1901.]

OFFICE OF STEAMER JOHN S. SIMMONS,
Paducah, Ky., July 4, 1904.

MY DEAR SIR: * * * I have never had any trouble with my lungs since I left Stanton, and have taken the best of care of myself, but have worked very hard, as this business [operating towing boats, Tennessee and Cumberland rivers] requires. I do not weigh as much by about ten or twelve pounds. This valley is a very hard climate to live in, as it is malarial, and I am touched with it all the time here. I would like to locate in a healthier climate, but my business is all here, and it is impossible to leave it long at a time. I have a large capital invested in my two plants, and you can see that I am a very busy man.

I can only think that Stanton did me a great deal of good and that I received all the attention and courtesies that were due me at that institution, and I shall not live long enough to ever forget the kind treatment I received at the hands of the persons in charge of the fort at the time of my stay at that place.

Very truly, yours,

JOHN S. SIMMONS.

Dr. P. M. CARRINGTON,
Fort Stanton, N. Mex.

RECOMMENDATIONS AND CONCLUSION.

For the consideration of the Bureau and in furtherance of the industrial idea for sanatoria in general and this sanatorium in particular, I wish to suggest that shops be established for the manufacture and repair of articles of furniture, etc., for the use of the sanatorium and for sale or barter under the proposed law relating to the subject. We have a variable number of patients, who are competent to do cabinet work in its several branches. If the commanding officer might be granted authority to employ such patients in accordance with their physical and technical ability, in a shop organized to do cabinet and repair work, paying them by the piece or job, many articles of furniture now purchased by the Purveyor and shipped from New York at considerable expense could be manufactured at the station, and all of our

repair work could be done in such a shop. Surplus articles thus made might be disposed of by sale or barter in accordance with the law which it is proposed to ask Congress to pass. The advantage of such a shop, operated on such a basis, will be primarily to give employment to convalescent patients, and the sale and barter of articles thus manufactured may operate to reduce very materially the running expenses of the sanatorium.

In any regulations made under such a law authority should be granted the commanding officer to use the moneys and materials accruing from the sale or barter of the products of the shop to purchase materials for additional articles to be manufactured or otherwise at his discretion, due care being had to matters of accountability for funds, and provisions being made to pay the piece wages of patients employed out of moneys so received.

Such a law should also permit the sale or barter of surplus and useless products, such as hogs and other live stock. Such sale and barter, so far from being opposed by the citizens of the vicinity, will be eagerly welcomed by them and will afford them a ready market for their products, as well as one in which they may procure in exchange for their products better grades of stock than they could otherwise afford to own.

The industrial shop suggested above has in it a great many possibilities which will develop according to circumstances and the exigencies of the station, and I believe the idea is well worthy of your careful consideration.

Respectfully,

P. M. CARRINGTON, *Surgeon, in Command.*

The SURGEON-GENERAL.

[Inclosure.]

REPORT OF LABORATORY, FORT STANTON, BY ASSIST. SURG. J. W. TRASK.

UNITED STATES PUBLIC HEALTH
AND MARINE-HOSPITAL SERVICE,
Fort Stanton, N. Mex., July 1, 1904.

SIR: I have the honor to make the following report of work done in this laboratory during the ten months from September 1, 1903, to June 30, 1904, in which I have been in charge of the work:

When first assigned to the laboratory I was the only one working in it, and even then not all of my time was devoted to it, inasmuch as sick call and surgical dressings for a while constituted part of my assignment. The laboratory at this time undertook to prepare stained specimens from the various organs and tissues of each body brought to necropsy, and with but one or two exceptions, such as in cases where relatives claimed the body for burial, a necropsy has been held on all patients who died at this sanatorium during the past ten months. It was then found that the work was more than one man could do, and an assistant, an undergraduate medical student, was placed in the laboratory to make routine urine and sputum examinations, which by this time constituted a considerable amount of work, inasmuch as we had nearly 200 patients whose sputum and urine were regularly examined every three months, and in cases where tubercle bacilli were absent, few, or hard to find, and these form a considerable percentage of the whole. Repeated examinations on successive days were made, and besides this, patients are continually being admitted and discharged, and in both of these cases the urine and sputa are examined. Later, a medical officer, Acting Assistant Surgeon Markoe, was detailed to assist in the sputum and urine examinations. In the meantime the laboratory had been carrying on special experimental and research work, and another medical officer, Acting Assistant Surgeon Laws, was detailed to assist in the preparation of tissues and stained specimens from necropsies. These three assistants spent only a part of their time in the laboratory, on an average not over two hours a day; the remainder of their time was occupied with other work.

Besides the routine laboratory work considerable other work has been carried on, as follows: Experiments to establish the condition of our hospital and dormitories with reference to their possible infection with tubercle bacilli; the administration of the tuberculin test to our dairy herd of 60 milk cows; work done to ascertain morphological, cultural, and pathological characteristics of the bacillus X of Maher; also the examination of milk from our different breeds of dairy cows to establish the absolute and relative value of their yield.

REPORT NO. 1.

FORT STANTON, N. MEX., *January 22, 1904.*

SIR: I have the honor to submit the following report of special work done in laboratory "to establish the condition of our hospital and other dormitories, with reference to their possible infection with tubercle bacilli:"

The following work was done in compliance with the first request of the following instructions:

UNITED STATES PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE,
OFFICE OF MEDICAL OFFICER IN COMMAND,
Fort Stanton, N. Mex., September 7, 1903.

SIR: I desire to have you take up as soon as practicable experiments to establish the condition of our hospital and other dormitories with reference to their possible infection with tubercle bacilli.

The resources of the laboratory, now in your charge, and including such a number of rabbits and guinea pigs as may be necessary, are at your disposal for this purpose. Individual cages for the animals to be used in the experiment are being made in order to avoid the error of having them confounded with other animals.

Upon the completion of these experiments you should render a report in detail, together with your conclusions.

Respectfully,

P. M. CARRINGTON,
Surgeon in Command.

Asst. Surg. J. W. TRASK,
Fort Stanton, N. Mex.

The experiments to ascertain whether or not our hospital was infected with tubercle bacilli were begun on September 14, 1903.

September 14, 1903, test tubes and petri dishes were washed clean; the test tubes were plugged with cotton and with the petri dishes sterilized with dry heat for one and one-half hours in the oven of a common kitchen range. (We have no dry-heat oven in the laboratory.)

September 15, 1903, pieces of wood, 3 inches long by one-fourth inch wide, by one-sixteenth inch thick, were placed in the covered petri dish and sterilized in dry-heat oven until they were charred brown.

September 16, 1903, made a salt solution of 6 parts sodium chloride and 1,000 parts of distilled water and boiled it in flask for one-half hour; then poured the salt solution into the sterilized test tubes to a depth of 3 inches and again sterilized tubes with salt solution for one hour in Arnold's steam sterilizer. They were then removed and allowed to cool. Then took to the hospital a copper basin and alcohol lamp, the test tubes with salt solution, and wood splinters in petri dish in which they had been sterilized. Sterilized a pair of artery forceps in boiling water by means of alcohol burner and copper basin. Then, with sterile forceps, grasped sterile splinter of wood, moistened wood in boiling water, then let it cool for few seconds, and with moist end of splinter dug dirt out of cracks and corners, then dropped the splinter along with the collected dust and dirt, which amounted to a mass larger than a marble, into a test tube containing the sterile salt solution. Then replaced cotton plug in tube and sterilized the mouth of tube with flame. This procedure was gone through with in each separate room in which dust was collected. The artery forceps were boiled between each operation. The amount of dust collected each time was sufficient to make the salt solution look muddy.

The test tubes were numbered from 1 up.

Test tube No. 1 contained dirt from the southwest and northwest corners of the floor of the hospital ward and from a crack in the center of the room.

Test tube No. 2 contained dirt from corners of floor and baseboard of hospital toilet room, in which the closets are located.

Test tube No. 3 contained dirt from corner and cracks in floor of room No. 7, occupied by negro patients.

The above tubes were shaken well and allowed to stand for two hours. They were again shaken and the salt solution and dirt in suspension poured into a sterile petri dish, each tube into a separate dish. Antitoxine syringes of 5 c. c. capacity and needles were sterilized in boiling water and allowed to cool. The solution and suspended dirt were then drawn from each dish separately into the sterile syringes, and guinea pigs were inoculated both hypodermatically and intraperitoneally with the solution, one pig hypodermatically and one pig intraperitoneally with each solution. The technique was as follows: The pigs were held by an assistant; hair over part of left side of abdomen was cut close with scissors, the clipped area and

surrounding hair was soaked with bichloride of mercury, 1:700; syringe needle was then passed through the skin to inoculate hypodermatically and through the entire abdominal wall in inoculating intraperitoneally.

The pigs were numbered from 1 up and when inoculated were placed in hutches also numbered from 1 up. Each hutch was marked with a card upon which were recorded the numbers of the pigs in it and also when, with what, and how much they had been inoculated. It also gave a description of the markings and colors of the pigs. In each hutch were put only the two which had been inoculated with the same tube of salt solution.

The pigs were used as follows:

Pig No. 1.—Large brown boar was inoculated subcutaneously with 2 c. c. of contents of tube No. 1 and placed in hutch No. 1 September 16, 1903.

Pig No. 2.—Black boar with brown spots was inoculated intraperitoneally with 2 c. c. of contents of tube No. 1 and placed in hutch No. 1 September 16, 1903.

Pig No. 3.—Black boar with white face was inoculated subcutaneously with 2 c. c. of contents of tube No. 2 and placed in hutch No. 2 September 16, 1903.

Pig No. 4.—Black boar with brown spots was inoculated intraperitoneally with 2 c. c. of contents of tube No. 2 and placed in hutch No. 2 September 16, 1903.

Pig No. 5.—Black boar was inoculated subcutaneously with 2 c. c. of contents of tube No. 3 and placed in hutch No. 3 on September 16, 1903.

Pig No. 6.—Black boar with brown spots was inoculated intraperitoneally with 2 c. c. of contents of tube No. 3 and placed in hutch No. 3 September 16, 1903.

On September 18, 1903, the head nurse at the hospital swept the wards and halls with a broom. (Schnauder is a robust, German, uninfected nurse, apparently in perfect health.) He then blew his nose into a clean piece of toilet paper and brought it to the laboratory in a clean paper filler, such as is used here in the hand sputum cups. The paper with discharge from nose was soaked and agitated in 0.6 per cent salt solution and was treated otherwise with the same care and technique as was used with the collections from the hospital floors. It was injected into guinea pigs as follows:

Pig No. 7.—Brown, black, and white boar was inoculated subcutaneously with 2½ c. c. of mixed salt solution and secretion from nurse's nose and placed in hutch No. 4 September 19, 1903.

Pig No. 8.—Black and brown sow was inoculated intraperitoneally with 2 c. c. of mixed salt solution and secretion from nurse's nose and placed in hutch No. 4 September 19, 1903.

November 12, 1903.—In order to ascertain the presence or absence of infection of the spray room, where many cases have their nares, pharynges, and larynges treated daily, and where there is necessarily much coughing, sneezing, and spraying, scrapings were made with a sterilized potato knife from the floor. The surface of the boards was scraped and what small amount of dirt had collected in the cracks was dug out from the area of the floor which is directly in front of where the patients sit and which, therefore, would be most apt to be infected. The collection thus made by scrapings was treated in exactly the same way as had been that collected from the floors at the hospital, and was injected into guinea pigs as follows:

Pig No. 11.—Brown and black sow was inoculated subcutaneously with 3 c. c. of salt solution and scrapings from spray room floor and placed in hutch No. 6 on November 12, 1903.

Pig No. 12.—Cream-colored boar was inoculated intraperitoneally with 3 c. c. of salt solution and scrapings from spray room floor and put in hutch No. 6 on November 12, 1903.

NECROPSY REPORT OF INOCULATED PIGS.

Pig No. 1.—Killed with chloroform January 13, 1904; was well nourished; body heat present; liver of rather dark color; spleen slightly pale; splenic follicles showed distinctly; kidneys normal; lymph glands not enlarged; heart filled with fluid blood; macroscopically no signs of disease were found; spleen was hardened in alcohol, and sections made from it showed neither tubercles nor tubercle bacilli.

Pig No. 2.—Well nourished; body heat present; killed with chloroform January 13, 1904; liver dark in color; spleen pale, but follicles easily seen; kidneys apparently normal; lymph glands not enlarged; heart filled with red clots; no macroscopical signs of disease; sections made from spleen showed neither tubercles nor tubercle bacilli.

Pig No. 3.—Well nourished; body heat absent; rigor mortis present; died December 8, 1903; no tubercles nor suspicious areas found anywhere in body; smears made from spleen and liver were entirely negative, and sections made from spleen showed neither tubercles nor tubercle bacilli.

Pig No. 4.—Died December 8, 1903; was well nourished; abdominal organs and heart vessels showed passive congestion; heart filled with red clots; spleen smears were negative as were also sections made from the same organ.

Pig No. 5.—Well nourished; died December 8, 1903; omentum and mesentery rich in fat; vessels of intestines injected; heart filled with red clot; smears made from spleen were negative, as were also sections made from same organ.

Pig No. 6.—Killed with chloroform January 13, 1904; well nourished; body heat present; lymphatic glands not enlarged; liver reddish brown in color; spleen somewhat pale; follicles visible, heart filled with red clots; no tubercle nor suspicious areas found anywhere; sections made from spleen showed neither tubercles nor tubercle bacilli.

Pig No. 7.—Killed with chloroform January 13, 1904; body heat present; well nourished; lymph glands not enlarged; liver reddish brown; spleen slightly pale; follicles of spleen visible; heart filled with fluid blood; no tubercles nor suspicious areas were found anywhere; sections made from spleen were negative.

Pig No. 8.—Died January 3, 1904; well nourished; congestion of small intestines; passive congestion of heart vessels; heart filled with semiliquid blood and currant-jelly clots; no tubercles nor suspicious areas found anywhere; sections of spleen showed neither tubercles nor tubercle bacilli.

Pig No. 11.—Killed with chloroform January 13, 1904; well nourished; lymph glands not enlarged; heart filled with dark fluid blood; no pathological lesions found; sections made from spleen showed neither tubercles nor tubercle bacilli.

Pig. No. 12.—Killed with chloroform January 13, 1904; well nourished; lymph glands not enlarged; right kidney contained many small urinary cysts, but was otherwise apparently normal; no pathological lesions other than the urinary cysts were found anywhere in the body, and sections made from spleen showed neither tubercles nor tubercle bacilli.

Of the 10 pigs inoculated, 3 died during the night of December 8, 1903, and one during the night of January 3, 1904. Both of these nights were very cold, and inasmuch as they died on the same nights as other pigs which had never been inoculated, and inasmuch as those which had been inoculated were all well nourished and apparently in good health up to the evening they died, and since no pathological lesions nor cause of death could be found post mortem, there seems no other explanation to be given, and, in my judgment, none needed other than that they died from the effects of cold.

Of the 4 that died because of cold, 3 had been inoculated two monthsand twenty-one days, and 1 three months and fifteen days previously. Of the 6 which were killed by chloroform anaesthesia 3 had been inoculated three months and twenty-eight days, 1 three months and twenty-five days, and 2 two months and one day previously. The interval between the time of their inoculation and death was in each case sufficient to have at least produced advanced tuberculosis, if not emaciation and death, had there been present tubercle bacilli in the material with which they were inoculated.

The 10 pigs were at time of necropsy without exception well nourished. Not one of them showed the least suspicion of a tuberculous lesion macroscopically, nor did sections of the spleens show any lesions microscopically.

As a check upon the technique, and to make the experiments as complete and thorough as possible, I used 2 guinea pigs as a control. I took sputum belonging to a patient and examined stained specimens of it to make sure of its containing tubercle bacilli. They were present in considerable numbers. I then took some of the sputum and agitated it in 0.6 per cent salt solution and on November 10, 1903, inoculated the two controls with it, using in every detail the same methods and syringes as were used with the other pigs.

Control A was inoculated subcutaneously with 2½ c. c. of the mixture of salt solution and sputum and was put in hutch No. 5.

Control B was inoculated intraperitoneally with 2½ c. c. of the mixture of salt solution and sputum, and as previously stated the same technique was used as had been employed with the other pigs. Control B was placed in hutch No. 5.

Control B died during the night of December 15, 1903, and the necropsy held the next morning showed emaciation; testicles soft; lymph glands of anterior mediastium enlarged, and in section they were found firm and containing yellowish nodules which composed the greater part of the gland; heart filled with currant-jelly clots; lungs congested and edematous; liver enlarged and mottled greenish yellow and reddish brown, and on section contained many greenish-yellow nodules: spleen many times enlarged and mottled reddish brown and white, and on section the white mottling of the surface was found due to large whitish nodules throughout the spleen; omentum was matted and thickened, adherent to itself in many places, and

contained many pin-head tubercles; mesenteric and retroperitoneal lymph glands enlarged and on section resembled those of the anterior mediastium; parietal peritoneum contained thickened yellowish patches; smears made from the spleen contained tubercle bacilli in considerable numbers; sections made from spleen showed the presence of tuberculous tubercles and of tubercle bacilli.

Control A was killed by chloroform on January 13, 1904. Necropsy showed emaciation marked. There was a softened caseated nodule which was just about to break at the point of inoculation. Spreads were made from the broken-down matter which escaped from the nodule when punctured, and when stained were found to contain tubercle bacilli. Mesenteric and inguinal glands were enlarged and some of them softened. Spleen was much enlarged and filled with white nodules. Liver contained many pearly nodules scattered throughout. Sections made from spleen showed tuberculous tubercles and tubercle bacilli.

It is seen from the above that the two controls inoculated with known cultures of tubercle bacilli became rapidly tuberculous; that control B lived but one month and five days and was found to have extensive general tuberculosis, and that control A, killed two months and three days after inoculation, was found in the same condition.

CONCLUSIONS.

In a room or building occupied by consumptives the part most apt to become infected is the floor, next to this the baseboards, and then the side walls for a distance of 2 or 3 feet from the floor. This is so because the greater amount of the scattering of bacilli is done by spraying when the patient talks or coughs.

The organisms leave the mouth in minute droplets of saliva and sputum, which, because of their weight, gravitate to the floor. Of course when these droplets dry they may, or rather the bacilli which were in them may, be stirred up in the dust and find lodgement on any and all dust-collecting surfaces and in spider webs. And on the floor the greatest infection will be found in the cracks and corners where dust and dirt collects and remains undisturbed for days, weeks, and perhaps months. The material collected for inoculation was from rooms occupied continually by consumptives in the last stages or from lavatories and the spray room daily used by them. It was removed from cracks and corners of floor, and in each case a considerable amount was scraped up and inserted in each tube of salt solution. The amount was such that had it been infected it was enough to guarantee a sufficient dose.

Since all the pigs thus inoculated were healthy up to the time of their death, and none of them either ante or post mortem showed any sign, symptom, or pathological lesion of tuberculosis, the only conclusion that can be drawn is that no living tubercle bacilli were present in the dirt removed from the hospital rooms and spray room; and since this dirt was taken from the parts of the rooms most exposed and liable to infection, it can further be concluded that no part of the above rooms contained living tubercle bacilli.

Therefore it can be said that the measures employed in the rooms tested are adequate to prevent infecting of floors and baseboards.

The measures used at the hospital are a weekly mopping of the floors with kerosene oil. In the spray room the floor is mopped weekly with bichloride of mercury solution 1:1000 and the room disinfected by formaldehyde gas as generated by a Kuhn generator.

Lest the question might be asked as to how long after the mopping with kerosene or bichloride of mercury was the material collected for inoculation, I will state that the scrapings were made five and six days after the moppings, that is, just before it was time for the next application of kerosene or bichloride.

TUBERCULIN TEST OF JERSEY HERD.

In testing out the cattle with tuberculin the routine advised by the Agricultural Department, Bureau of Animal Industry, was followed. The temperature of each cow was taken per rectum at 8 a. m., 10 a. m., 12 noon, 2 p. m., 6 p. m., and at 10 p. m. Immediately after the last temperature 2 c. c. of tuberculin were injected subcutaneously just back of the right shoulder. Then on the following day the temperature was again taken per rectum at 8 a. m., 10 a. m., 12 noon, 2 p. m., 4 p. m., and 6 p. m. Sixty cows were thus tested. One of the cows reacted. Her maximum temperature before injection was 38.4° C. and after injection 40.1° C. Eight days later she was again tested and her maximum temperature before injection was 38.6° C. and after 39.6° C. Thus the rise in temperature was 1.7° C. after the first test and 1° C. after the second. This cow was killed and a necropsy held, but no lesions were found macroscopically. Her remains were burned.

BACILLUS X OF MAHER.

Considerable time was spent in studying the Bacillus X of Maher. Seventy-nine patients were later inoculated with it at their own request, and in all 102 inoculations were made. But inasmuch as this work is not as yet completed a detailed report will be made later.

J. W. TRASK,
Assistant Surgeon, Public Health and Marine-Hospital Service,
In Charge of Laboratory.

P. M. CARRINGTON,
Medical Officer in Command, Fort Stanton, N. Mex.

REPORT OF MILK EXAMINATIONS.

FORT STANTON, N. MEX., *July 1, 1904.*

SIR: In accordance with your verbal request made about ten days ago, asking that an examination of the milk from the different breeds of milk cows be made to ascertain their relative worth as a food, and especially to determine whether or not there is any difference in the size of the fat globules in the milk from the various breeds, I have the honor to report that I have examined 10 specimens, that there was no appreciable difference in the size of the fat globules in the milk from cows of different breeds. The fat globules varied in each specimen from 1 to 8 micromillimeters in diameter, the greatest number measuring 2 to 3. There were a great number of bacteria in each sample, which would indicate that the milk had not been properly cooled after milking. The Jersey cows were the only ones which produced what is considered a proper percentage of cream. Both the Holsteins and half-breeds (Hereford and Jersey) fell considerably below the normal in cream production. Seven of the 10 specimens of whole milk examined fell below 1.029 in specific gravity, which is considered the minimum for good milk. There were 10 specimens examined, 4 Jerseys, 4 Holstein, and 2 half-breed (Hereford and Jerseys).

The following are the specific gravities:

THE WHOLE MILK.

Jersey.	Holstein.	Half-breed.
1.02842	1.02987	1.029
1.02755	1.02958	1.02697
1.02813	1.02871	.....
1.02784	1.02842	.....

SKIMMED MILK.

1.02958	1.03016	1.02987
1.03117	1.03074	.....

The cream percentages were—

Jersey.	Holstein.	Half-breed.
Per cent.	*Per cent.*	*Per cent.*
9.0	8.0	8.3
13.3	7.2	.....
10.77	.....	.....

Respectfully,

J. W. TRASK,
Assistant Surgeon,
Public Health and Marine-Hospital Service,
In Charge of Laboratory.

MEDICAL OFFICER IN COMMAND,
Fort Stanton, N. Mex.